

REMARKS

Claims 1-73 are now pending, wherein claims 1, 6, 12, 26, 28 and 31 are amended and claims 37-73 are added. Favorable reconsideration is respectfully requested.

On page 2 of the final Office Action, claims 1, 3, 4, 9-13, 16-18, 24, 25, 31 and 33-36 were rejected under 35 U.S.C. §102(e) as being anticipated by the *Velazquez* patent publication. By way of the present Amendment, independent claims 1 and 31 have been amended. To the extent that the Office may consider the rejection to apply the amended claims, the rejection is respectfully traversed.

Amended claim 1 is directed to an apparatus for selectively receiving a radio frequency (RF) signal. The apparatus includes, *inter alia*, an array of antenna elements for receiving at least one RF signal containing information for determining actual coordinates of the apparatus, a navigational controller for determining a pointing vector for each RF signal from the determined coordinates, and beam-forming electronics connected to the array of antenna elements and the navigational controller for forming a reception lobe for each determined pointing vector in the direction of the pointing vector.

An exemplary configuration the claimed apparatus is shown in Figure 1 and described in Applicant's specification starting at page 8. As depicted in Figure 1, an apparatus 100 for selectively receiving a radio frequency includes an antenna array 101, beam forming electronics 103, and a navigational controller 105. The antenna array 101 of apparatus 100 comprises a plurality of antenna elements 201 for receiving at least one RF signal. (See Figure 2 and Applicant's specification, ¶¶ 0036-0041.) An exemplary navigation controller 105, as shown with more detail in Figure 4 and described in page 13, ¶ 0048 of Applicant's specification, may include a receiver 401 for receiving RF signal transmissions that convey absolute position information of the apparatus and a navigation processor 405 for calculating a pointing vector based on the received absolute position information. For example, as described on page 14 of the specification, a receiver 401 (e.g., a GPS receiver) may transmit absolute position information, in the form of pseudo and delta range information 407, to the navigation processor 405. Based upon the absolute position information 407, the navigation processor 405 is able to determine the location of a

source transmitter (e.g., a GPS satellite), and create a pointing vector 309, indicating the direction of the source transmitter to allow the beam-forming algorithm processor 305 to create reception lobes in the direction of the pointing vector. (See Figure 3, and the specification, ¶¶ 0042-0047.)

In contrast to the apparatus recited in claim 1, the *Velazquez* publication does not disclose an apparatus having “an array of antennas elements for receiving at least one RF signal containing information for determining actual coordinates of the apparatus....” That is, while *Velazquez* describes a system in which a beam steering antenna array is included in a base station 20 or a mobile unit 30, the mobile unit 30 transmits data about its respective coordinates to either a base station 20 or to another mobile unit, and that the base station may transmit information about its location to a mobile unit and receives coordinates information transmitted from a mobile unit. (See the *Velazquez* document, ¶¶ 0055-0057.) Thus, the *Velazquez* publication discloses that location information received by a mobile unit and a base station is position information about another mobile unit or base station. In other words, there is no mention in the *Velazquez* document that a received RF signal contains information for determining coordinates of the device receiving the RF signal. Moreover, because the location of a base station 20 is fixed and known, there is no apparent reason for the base station to receive data concerning its own location. (See the *Velazquez* document, ¶ 0059.)

The *Velazquez* publication also appears to disclose that a mobile unit includes a GPS antenna 520 that is separate from antenna array elements 35'. (See the mobile receiver module 340 in Figure 12.) Hence, the *Velazquez* publication does not appear to disclose that RF signals, which include information concerning the location of an apparatus, is received by an antenna array of the apparatus.

Claim 1 further recites the feature of “beam-forming electronics ... for forming a reception lobe for each determined pointing vector in the direction of a pointing vector.” It is respectfully submitted that this recitation sets forth further distinguishing features not found in the *Velazquez* publication because the claimed pointing vector is determined from the coordinates of the apparatus, and these coordinates, in turn, are determined from the information contained in the RF signal received by an antenna array of the apparatus.

For at least the above reasons, no *prima facie* case of anticipation exists with respect to the *Velazquez* publication. As such, claim 1 is patentable.

Amended independent claim 31 is believed patentable for reasons similar to those described above in connection with independent claim 1. For instance, claim 31 is directed to a method of selectively receiving an RF signal comprising the steps of receiving at least one RF signal using an array of antenna elements, determining coordinate information concerning the location of the array of antenna elements from information conveyed by each received RF signal, determining a pointing vector for each RF signal from the coordinate information, and forming a reception lobe of the antenna array for each determined pointing vector to detect an RF signal source in the direction of the pointing vector. As pointed out above, the *Velazquez* publication does not disclose that coordinate information pertaining to the location of a receiver is determined from information conveyed by an RF signal received by an antenna array. Hence, the *Velazquez* publication does not disclose or suggest receiving information pertaining to the location of any part of a receiver, much less information concerning the location of the array of antenna elements, as claimed. It necessarily follows that the *Velazquez* publication also fails to disclose determining a pointing vector, for each received RF signal, from determined coordinate information.

For at least these reasons, Applicant submits that claim 31 recites a combination that is neither explicitly or inherently disclosed in the *Velazquez* publication. As such, claims 31 is not anticipated by this document. Applicant respectfully submits that dependent claims 3, 4, 9-13, 16-18, 24, 25, and 33-36 also are patentable at least for the reasons given above with respect to their parent claims, and further for the additional features recited.

The Office Action, at page 3, rejected claims 1, 3, 4, 9-13, 16-18, 24, 25, 31 and 33-36 under 35 U.S.C. § 102(e) as being anticipated by the *Taniguchi* patent publication. It is respectfully submitted, however, that the *Taniguchi* patent fails to anticipate the amended claims for at least the same reasons given above.

The *Taniguchi* publication describes a system including a base station 1 having an array of antenna elements 11 for receiving location data transmitted from a mobile unit 2. According to *Taniguchi*, each mobile unit 2 uses a GPS receiver to determine its own

absolute position and the determined position information is transmitted to the base station 1. The base station 1 uses the transmitted position information to determine "the direction and beam width (radiation angle) of each beam which is radiated from the adaptive array antenna 11." (See the *Taniguchi* patent, ¶¶ 0044, 0062.) *Taniguchi* also describes a triangulation process for determining a relative position of a mobile unit 2 with respect to a base station 1. (See *Taniguchi*, ¶ 0044.)

Applicant respectfully submits that there is no disclosure in the *Taniguchi* publication, including the descriptions of transmitted position data, that explicitly or necessarily disclose an apparatus including, *inter alia*, an array of antenna elements for receiving at least one RF signal containing information from which actual coordinates of the apparatus are determined, and a navigational controller for determining a pointing vector for each RF signal from the determined coordinates, as claimed. To the contrary, *Taniguchi* discloses that location information received by the array 11 of the base station pertains to actual or relative position of a mobile unit. Hence, the received position information as disclosed in the *Taniguchi* publication is fundamentally different from what is recited in claim 1. Furthermore, because the location of the base station 1 described in *Taniguchi* appears to be known and fixed, there is no implicit disclosure in *Taniguchi* of any base station antenna array for receiving signals conveying information for determining coordinates of the base station.

For at least these reasons, it is respectfully submitted that the *Taniguchi* patent fails to anticipate amended independent claim 1. For the same reasons, the *Taniguchi* patent also fails to anticipate the combination of steps of amended independent claim 31, which recites similar patentably distinct subject matter. Accordingly, Applicant respectfully requests withdrawal of the rejection of claims 1 and 31, and hence also of their respective dependent claims 3, 4, 9-13, 16-18, 24, 25 and 33-36. In addition, the dependent claims recite various combinations that include further features not found in the *Taniguchi* patent.

On page 5 of the final Office Action, claims 1-6, 8-31, and 33-36 were rejected under 35 U.S.C. § 102(b) as being anticipated by the *Bartholomew* patent. The *Bartholomew* patent, however, is likewise deficient with respect to the amended claims. For instance, the *Bartholomew* patent describes an antenna controller 1204 that receives

“external input data” relating to the geographic distribution of mobile units and responds by altering a radiation pattern (see the *Bartholomew* patent, column 41, lines 23-38). This process involves a mobile unit transmitting data related to its absolute position (which data is generated by way of a GPS receiver) to the base station receiver (see *Bartholomew*, column 42, lines 51-58; column 43, lines 7-9). The base station includes a processor 1208 that processes the received position data to calculate the location of the mobile unit relative to the antenna site (see *Bartholomew*, column 43, lines 35-52). Hence, the *Bartholomew* patent does not describe an antenna array for receiving at least one RF signal containing information for determining actual coordinates of the apparatus, as set forth in amended claim 1. Moreover, because the base stations described in the *Bartholomew* patent are known and fixed at a single location (see the *Bartholomew* patent, column 43, lines 30-35), there is no suggestion in *Bartholomew* of a configuration including antenna array elements for receiving information for determining the base station's coordinates.

Similar distinctions are also brought out in amended claim 31. For instance, the *Bartholomew* patent fails to disclose, *inter alia*, the combination of steps including receiving at least one RF signal using an array of antenna elements, determining coordinate information concerning the location of the array of antenna elements from information conveyed by each received RF signal, and determining a pointing vector for each RF signal from the determined coordinate information. At least for the above reasons, it is respectfully submitted that *Bartholomew* does not disclose these claimed features.

Claims 2-6, 8-30 and 33-36 are patentable at least by virtue of their dependence from one of dependent claims 1 and 31, and further for the additional features set forth therein.

Claims 1-36 were rejected under 35 U.S.C. § 102(b) as being anticipated by the *Dixon* patent. Insofar as the Office may consider this rejection to apply to the presently amended claims, this rejection is respectfully traversed.

It is respectfully submitted that amended claims 1 and 31 recite combinations that include a number of features that are not described or suggested in the *Dixon* patent. The differences between the pending claims and the *Dixon* patent are pointed out in the discussion after the following summary of the *Dixon* patent.

The *Dixon* patent is directed to an “earth station,” which may have an array antenna 204 consisting of patch elements 302, 303 (see *Dixon*, column 10, lines 15-20). The earth station includes a processing unit 203 having an antenna position and orientation unit 601 configured to receive information from a GPS receiver 304 and calculate the area of the sky in which the antenna is currently directed, and an antenna pointing processor unit 607 for calculating positions of satellites in a table look-up of tabulated satellite position data relative to the earth station. The processing unit 607 is configured to determine a direction in which to configure the antenna for enabling it to communicate with a selected satellite (see *Dixon*, column 12, lines 39-47; and column 13, lines 11-13) and to effect pointing of the antenna radiation beam in the determined direction by calculation of phase weights (see column 13, lines 18-20). Antenna arrangement 204 may be a phased array in which the relative phase of the signals is weighted across the face of the array to electronically steer a beam (see column 10, lines 14-27; column 11, lines 19-27 and lines 59-61; and column 25, lines 38-45).

The *Dixon* patent, however, does not disclose the feature of “an array of antenna elements for receiving at least one in RF signal containing information in determining actual coordinates of the apparatus ...,” as claimed. Rather, for the earth station of *Dixon* to operate in any of the first through fourth categories of satellite configurations disclosed in *Dixon* (see Figure 1 and column 8, line 43 to column 9, line 11), the position of the earth station must first be obtained using a GPS receiver 304. (See *Dixon*, column 10, lines 2-5; Figure 3; column 10, lines 37-42, 51-54; and column 17, line 50 to column 18, line 8.) The *Dixon* patent, however, is silent as to any particular antenna structure used in the GPS receiver 304. Moreover, *Dixon* does not mention that the array antenna 204 receives any RF signal containing information for determining coordinates of the earth station. To the contrary, *Dixon* appears to teach away from an antenna array for receiving signals containing information for determining coordinates because *Dixon* explicitly discloses that position information is received by the GPS receiver 304 before the array is configured to be steered in any particular direction.

The relevance of the antenna array feature of claim 1 becomes particularly apparent when considering the next recited features of “a navigational controller for determining a

pointing vector for each RF signal from the determined coordinates; and beam-forming electronics connected to the array of antenna elements and the navigational controller for forming a reception lobe for each determined pointing vector in the direction of the pointing vector." In other words, these further features of claim 1 recite that coordinates determined from an RF signal received by an antenna array of the apparatus are utilized to determine a pointing vector, and this pointing vector, in turn, is utilized by beam forming electronics for forming a reception lobe in the direction of the pointing vector. By contrast, when the earth station of the *Dixon* patent receives position information from a signal, it is only by way of a GPS receiver. Furthermore, a direction of a beam determined from a received GPS signal points to a satellite that is different from the one from which position information is received. Thus, the amended claims recite subject matter which defines significant differences from the earth station disclosed in the *Dixon* patent.

The MPEP § 2131 instructs that "[t]o anticipate a claim, the reference must teach every element of the claim. 'A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.' *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). As pointed out above, claim 1 recites a combination of features that is not disclosed in the *Dixon* patent. Hence, claim 1 is not anticipated by this document. Claim 31 is directed to a method for selectively receiving an RF signal that likewise recites a combination of features that is patentably distinguished over the *Dixon* patent. Applicant therefore requests that the rejection of claims 1 and 31 be withdrawn.

Claims 2-30 and 32-36 each depend from one of independent claims 1 and 31 and are therefore patentable for at least the above reasons. Furthermore, dependent claims 2-30 and 32-36 recite combinations that include additional features, and therefore set forth further points of novelty. For example, claim 2 recites that the elements of the array comprise dual-frequency patch elements. It is respectfully submitted that the *Dixon* patent does not disclose this feature. This is but one example of several regarding the recitations of the dependent claims being separately patentable from the applied art.

New claims 37-66 are directed to an apparatus for selectively receiving a radio frequency (RF) signal. The apparatus set forth in independent claim 37 includes, *inter alia*,

a navigational controller which utilizes an inertial measurement unit (IMU) for measuring changes in relative position of the apparatus. For example, as described in Applicant's specification, at pages 13-15, the calculation of the pointing vector may be based in part on information regarding changes in relative position of the apparatus received from an IMU 403. New claims 67-73 recite similar features with respect to a method for selectively receiving an RF signal. It is respectfully submitted that none of the currently cited references, whether taken individually or in any combination, teach or otherwise suggest the combination of features of claims 37-66.

For at least the foregoing reasons, Applicant respectfully submits that all pending claims, each taken as a whole, patentably define over the prior art. It is respectfully submitted that the present application is in condition for allowance and a notice to that effect is earnestly solicited.

Respectfully submitted,

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